Space Weather Forecast

Issued on Saturday, 17 February 2024 at 12:56 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Decreasing chance of Moderate flares, and slight chance of Strong flares. Slight chance of solar radiation storms, decreasing later.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate activity with one Moderate flare observed from the large sunspot region just over the southwest limb. This region continues to be the main risk for further flare activity, despite now retreating on the far-side as its magnetic looping remains visible. There are nine Earth-sided sunspot regions, with the largest and most likely flare source of these being a wide region in the northwest. This has ongoing growth around its leader spot leading with the development of intermediate spots and increasing complexity. The other regions on the disc are all smaller and simpler

No Earth-directed CMEs (Coronal Mass Ejections) were observed in this period, although a faint eruption from the southwest disc at around 17/0219 UTC has been assessed as both slow and likely passing south of Earth.

Solar Wind / Geomagnetic Activity: Solar winds have been at background, at around 350 km/s. Interplanetary Magnetic Field (IMF) was initially moderate, but eased by 16/1750 UTC to be weak. North-south component of the magnetic field was initially moderately positive (northward) but slowly eased with brief periods of weakly negative (southward) field. Geomagnetic activity was Quiet (Kp 0 to 2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was elevated above background levels, but with a declining trend and persisted below the S1/Minor Radiation storm threshold throughout.

Four-Day Space Weather Forecast Summary

Solar Activity: Moderate to Low activity is forecast, with an ongoing but decreasing chance of isolated Moderate flares. There remains a slight chance of a Strong flare on day 1 (17 Feb), primarily from the region just over the southwest limb.

Solar Wind / Geomagnetic Activity: Recent CMEs are expected to either miss or only have very minimal impact on Earth, with the most likely for an Earth-directed component being the eruption from the north-disc on 16 Feb, passing near Earth on day 3-4 (19 Feb or early 20 Feb). No other significant solar wind enhancements feature in the period with mainly background winds expected. Geomagnetic activity is expected to be mostly Quiet through this period, perhaps becoming Unsettled with Active intervals with any CME arrival on days 3-4 (19-20 Feb).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to continue declining towards background levels. However, any further eruption from either the far-sided region, or perhaps those currently on the west limb, could bring further enhancements, with a slight chance of reaching the S1 Minor Solar Radiation Storm level.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	50	40	40
Very Active	R3 to R5 X	No	15	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	15	15	10	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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